

## **REMARKS**

### **I. INTRODUCTION**

Upon entry of the present amendment, claims 6-17, 29, 31, 35-36, 40, 46, 48-55, 78, 81-84, 86-87, 89, 92-94, 96-97, 99 and 102 will be pending in the present application. By the present amendment, claims 6, 13, 14, 17, 29, 31, 35-36, 40, 46, 48-55, 78, 83, 86-87, 89, 92-94, 96-97, 99 and 102 have been amended, and claims 1-5, 18-28, 30, 32-34, 37-39, 41-45, 47, 56-77, 79-80, 85, 88, 90-91, 95, 98 and 100-101 have been cancelled. No new matter has been added herein by the present amendment, as support thereof may be found in the current specification at, *inter alia*, paragraphs [0028] and [0045].

In view of the foregoing amendments and the following remarks, Applicants respectfully submit that the claims are now in condition for allowance. Applicants point out that the amendments made herein are made without prejudice to the future prosecution of such cancelled, amended or modified subject matter in a related divisional, continuation or continuation-in-part application.

### **II. REJECTIONS UNDER 35 U.S.C. §112, FIRST PARAGRAPH**

Claims 78-82, 92 and 102 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. As set forth below, Applicants respectfully submit that the claims fully comply with the enablement requirement of section 112 and request that this rejection be withdrawn.

The test for enablement is whether a person skilled in the art could make and use the invention as claimed without undue experimentation. *United States v. Teletronics, Inc.*, 857

F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988) (“The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation.”). The fact that experimentation may be complex does not necessarily make it undue, if the art typically engages in such experimentation. *In re Certain Limited-Charge Cell Culture Microcarriers*, 221 USPQ 1165, 1174 (Int’l Trade Commission 1983), *aff’d. sub nom., Massachusetts Institute of Technology v. A.B. Fortia*, 774 F.2d 1104, 227 USPQ 428 (Fed. Cir. 1985). *See also In re Wands*, 858 F.2d at 737, 8 USPQ2d at 1404. A specification disclosure which contains a teaching of the manner and process of making and using an invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented must be taken as being in compliance with the enablement requirement of 35 U.S.C. §112, first paragraph. MPEP § 2164.01.

Independent claim 78 in amended form is directed to an electron transporting material comprising an organic matrix and a dopant, wherein said dopant is incapable of transferring charge to said organic matrix except when said dopant is optically excited. The recited dopant is an organometallic compound comprising Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, Cd, Hf, Ta, W, Re, Os, Ir, Pt, Au or Hg, and the optically excited dopant transfers electrons to said organic matrix. Claim 78 has been amended herein to more closely correspond to the description in the specification (in paragraphs [0071]-[0072]) of embodiments wherein the organometallic dopant is incapable of transferring charge to the organic matrix except when the dopant is optically excited.

Applicants provide a description of some exemplary organometallic compounds which can be used as optically activated dopants in paragraph [0072] of the specification. A person of ordinary skill in the art would be familiar with optically activated organometallic compounds, as such organometallic compounds are known in the art. Thus, the determination of suitable metals and/or ligands which would make up the optically activated organometallic compounds would not constitute undue experimentation as such compounds were known in the art.

In view of the above, Applicants respectfully submit that a person of ordinary skill in the art would be able to make and use the claimed materials and devices without undue experimentation.

### III. REJECTIONS UNDER 35 U.S.C. § 102 BASED ON KIM

Claims 1, 2, 5, 6, 12 and 15 stand rejected under 35 U.S.C. §102(b) as being anticipated by US 4,618,453 ("Kim"). It is respectfully submitted that these rejections should be withdrawn for at least the following reasons.

Kim is directed to conductive heterocyclic ladder polymers, and discloses a polymer doped with n-butyl Li. *See* Kim, claim 14.

In contrast to the teachings of Kim, independent claim 6 includes the recitation that "said organometallic compound comprises Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, Cd, Hf, Ta, W, Re, Os, Ir, Pt, Au or Hg." Kim does not teach nor suggest an organometallic compound including any of these recited metals.

Thus, for at least the preceding reasons, it is respectfully submitted that the claim rejections under 35 U.S.C. § 102 based on Kim have been overcome and should therefore be withdrawn.

IV. REJECTIONS UNDER 35 U.S.C. § 102 BASED ON LIM

Claims 1, 2, 6, 11, 31-33, 35-38, 40, 46-48, 50, 51 and 56 stand rejected under 35 U.S.C. §102(b) as being anticipated by US 4,066,569 ("Lim"). It is respectfully submitted that these rejections should be withdrawn for at least the following reasons.

Lim is directed to redox dopants for dynamic scattering liquid crystals. According to Lim, "[r]edox dopants are defined as a combination of donors (D) and acceptors (A) that readily undergo reversible electrochemical reactions, and which do so at lower voltages than the electrochemical reactions of the LC (liquid crystals) components." Lim, Column 2, lines 33-37. Lim discloses that "[m]etalloenes when mixed with conjugated cyano-organic compounds such as 7,7',8,8'-tetracyanoquinodimethane (TCNQ) and (2,4,7-trinitro-9-fluorenylidene)-malononitrile (TFM) function as excellent dopants for liquid crystals." Lim, abstract.

In contrast to the teachings of Lim, independent claims 6, 31, 36 and 46 include the recitation of "wherein said dopant is an organometallic compound" (claims 6, 31, 36) or "wherein said dopant is a metallocene" (claim 46). That is, in the presently recited claims, the dopant is only an organometallic compound or a metallocene (*i.e.*, the claimed dopants are single substances, not mixtures of substances). However, Lim teaches that "the redox dopants may be formed from mixtures of metalloenes, which function as donors, and conjugated cyano-organic

compounds, which function as acceptors, dissolved in the liquid crystal or liquid crystal mixture host compounds." Lim, column 3, lines 4-8 (emphasis added). That is, Lim teaches that it is this salt-like mixture which serves as the redox dopant doped into a liquid crystal host. Thus, Lim fails to teach or suggest a dopant which is an organometallic compound or a metallocene, and therefore also fails to teach or suggest a dopant which is capable of transferring electrons to a host organic matrix.

Thus, for at least the preceding reasons, it is respectfully submitted that the claim rejections under 35 U.S.C. § 102 based on Lim have been overcome and should therefore be withdrawn.

V. REJECTIONS UNDER 35 U.S.C. §§ 102 & 103 BASED ON KIDO ET AL.

Claims 1, 2, 5, 6, 8-10, 29, 31-33, 36-38, 83, 84, 86, 87, 93, 94, 96 and 97 stand rejected under 35 U.S.C. §102(b) as being anticipated by EP 1011155 A2 ("Kido et al."), and claims 7, 8, 11-15, 29, 32 and 37 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kido et al. It is respectfully submitted that these rejections should be withdrawn for at least the following reasons.

Kido et al. is directed to an organic electroluminescent device. According to Kido et al., "[t]he electroluminescent device further includes an organic layer adjacent to the cathode electrode, the organic layer being a mixed layer of an electron-transporting organic compound and an organic metal complex compound containing at least one member selected from the group including an alkali metal ion, an alkali earth metal ion and a rare earth metal ion." Kido et al., paragraph [0011].

In contrast to the teachings of Kido et al., independent claims 6, 29, 31 and 36 include the recitation that the organometallic dopant or compound “comprises Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, Cd, Hf, Ta, W, Re, Os, Ir, Pt, Au or Hg.” That is, the presently recited organometallic dopant or compound includes a first, second or third row transition metal from any of Groups 4 through 12. However, Kido et al. teaches that the organic metal complex compound disclosed therein contains an alkali metal ion, an alkali earth metal ion or a rare earth metal ion. Thus, Kido et al. does not teach nor suggest an organometallic dopant or compound including any of the recited transition metals.

Thus, for at least the preceding reasons, it is respectfully submitted that the claim rejections under 35 U.S.C. §§ 102 and 103 based on Kido et al. have been overcome and should therefore be withdrawn.

VI. REJECTIONS UNDER 35 U.S.C. §§ 102 & 103 BASED ON HSIEH

Claims 1, 2, 5, 6, 9-13, 15, 31-33, 36-38, 46-48, 54-56, 83, 84, 86, 87, 89, 93, 94, 96, 97 and 99 stand rejected under 35 U.S.C. §102(b) as being anticipated by US 5,853,906 (“Hsieh”), and claims 7, 8, 14, 29, 35, 40 and 49-53 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hsieh. It is respectfully submitted that these rejections should be withdrawn for at least the following reasons.

Hsieh is directed to conductive polymer compositions and processes thereof. Hsieh discloses a conductive coating comprising an oxidized oligomer salt, a charge transport component, and a polymer binder. Hsieh, abstract. According to Hsieh, the oxidized oligomer salt may be an oxidized oligo-metallocene salt as described in column 25, lines 22-43. The

oxidized oligo-metallocene salt as described in Hsieh has a cationic metallocene component and a monovalent anionic component. *See* Hsieh, column 25, lines 22-43.

In contrast to the teachings of Hsieh, independent claims 6, 29, 31, 36 and 46 include the recitation that the dopant “is capable of transferring electrons to said organic matrix.” However, the oxidized oligo-metallocene compound as described in Hsieh is the cationic component of the salt, with a charge of  $m+$ . As such, this oxidized oligo-metallocene compound as described in Hsieh is not capable of transferring electrons to an organic matrix. That is, rather than being an electron donor, the oxidized oligo-metallocene compound as described in Hsieh is an electron acceptor.

Thus, for at least the preceding reasons, it is respectfully submitted that the claim rejections under 35 U.S.C. §§ 102 and 103 based on Hsieh have been overcome and should therefore be withdrawn.

VII. REJECTIONS UNDER 35 U.S.C. § 103 BASED ON KIDO ET AL. IN VIEW OF THOMPSON

Claims 35 and 40 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kido et al. in view of US 5,811,833 (“Thompson”). It is respectfully submitted that these rejections should be withdrawn for at least the following reasons.

As described above, Kido et al. fails to teach or suggest the recited organometallic dopant or compound including a first, second or third row transition metal from any of Groups 4 through 12. Thompson fails to cure these shortcomings.

Thus, for at least the preceding reasons, it is respectfully submitted that the claim rejections under 35 U.S.C. § 103 based on Kido et al. in view of Thompson have been overcome and should therefore be withdrawn.

VIII. REJECTIONS UNDER 35 U.S.C. § 103 BASED ON SWAGER

Claims 1, 2, 6, 12, 15-17, 36-38 and 40 stand rejected under 35 U.S.C. §103(a) as being unpatentable over US 7,186,355 ("Swager"). It is respectfully submitted that these rejections should be withdrawn for at least the following reasons.

Swager is directed to insulated nanoscopic pathways, and compositions and devices of the same. According to Swager,

[t]he nanoscopic pathway can be an organic group, an organometallic compound, a coordination compound, a salt, a nanoparticle, a carbon nanotube, a biological species and combinations thereof. In one embodiment, the nanoscopic pathway can be provided by a molecular system (e.g. an organic or organometallic group) having a bonding arrangement which affords delocalization of electronic charge extending throughout a portion or entire length of the molecule. Thus, the nanoscopic pathway can have a length equal to the length of the molecule. In another embodiment, the nanoscopic pathway can comprise a series of interconnected nanoscopic pathways, and the length of the pathway is equal to a total length of the interconnected series of pathways.

Swager, column 5, lines 38-51. In claim 1 of Swager, a conducting polymer is disclosed as the nanoscopic pathway, and the conducting polymer may include one or two metals within the repeating structural unit of the polymer. *See* Swager, column 23, lines 1-39.

In contrast to the teachings of Swager, independent claims 6 and 36 include an organic matrix with an organometallic compound doped therein, wherein said dopant is capable of transferring electrons to said organic matrix. In Swager, although the conducting polymer of



claim 1 may include one or two metals within the repeating structural unit of the polymer, the polymer is not "doped" with an organometallic compound. Rather, one or two metals may form part of the elements which make up the continuously lined backbone of the polymer itself. *See* Swager, column 23, line 24 (listing  $-\text{CC}-\text{M}-\text{CC}-$  as a possible substitution for B and D). Furthermore, there is no suggestion in Swager that would lead one of ordinary skill in the art to covalently attach an organometallic compound to the conducting polymer of claim 1 in Swager, and there is no reason why one of ordinary skill in the art would do so.

Thus, for at least the preceding reasons, it is respectfully submitted that the claim rejections under 35 U.S.C. § 103 based on Swager have been overcome and should therefore be withdrawn.

IX. MISCELLANEOUS

Applicants thank the Examiner for noting the miscellaneous spelling errors in claims 13, 14 and 17. These spelling errors have been corrected by the present amendment.

X. CONCLUSION

Applicants respectfully submit that the pending claims are in condition for allowance and request that such action be taken. If for any reason the Examiner believes that prosecution of this application would be advanced by contact with the Applicants' attorney, the Examiner is invited to contact the undersigned at the telephone number below.

Respectfully submitted,

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By: /Kevin T. Godlewski/  
Kevin T. Godlewski (Reg. No. 47,598)

KENYON & KENYON LLP  
One Broadway  
New York, NY 10004  
Direct Dial: 212-908-6203  
Fax: 212-425-5288  
General Tel: 212-425-7200